J.A. Martín-Pereda
E.T.S.Ing. Telecomunicación
Universidad Politécnica Madrid. C.U.
28040 MADRID SPAIN

NEW ACTIVE DEVICES IN OPTICAL FIBRE COMMUNICATIONS: OPTICAL BISTABLE SYSTEMS.

In this paper, some fundamental mechanisms concerning optical bistability in some active devices, will be identify. A review of intrinsic and hybrid bistable optical devices will be given. The main modes of operation to be covered will be: optical memory, pulse shaper, differentical amplifier, optical triode, optical limiter and clipper, and optical oscillator. Moreover, some new modes of operation, namely nonlinear interfaces, will appear as potential future devices. As final example, an otpical time-division multiplexer and demultiplexer, based on the above mechanisms, will be proposed.

Because the present state-of-the-art in intrinsic optical bistability and the lack of adequate materials to operate in the physical limits of digital optical switching and logic elements, a particular modelling with liquid crystals will be studied.